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Title: Circumpolar observations of ice wedge melting and thermokarst pool expansion

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# Circumpolar observations of ice wedge melting and thermokarst pool expansion

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February 22, 2021

# Ice wedges

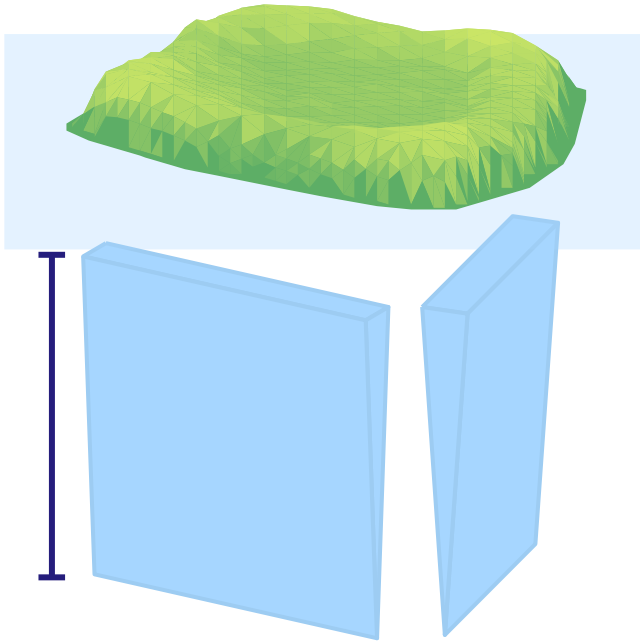


*Erika Podest, NASA Jet Propulsion Laboratory*

[www.page21.eu/gallery/field-stations-2012](http://www.page21.eu/gallery/field-stations-2012)

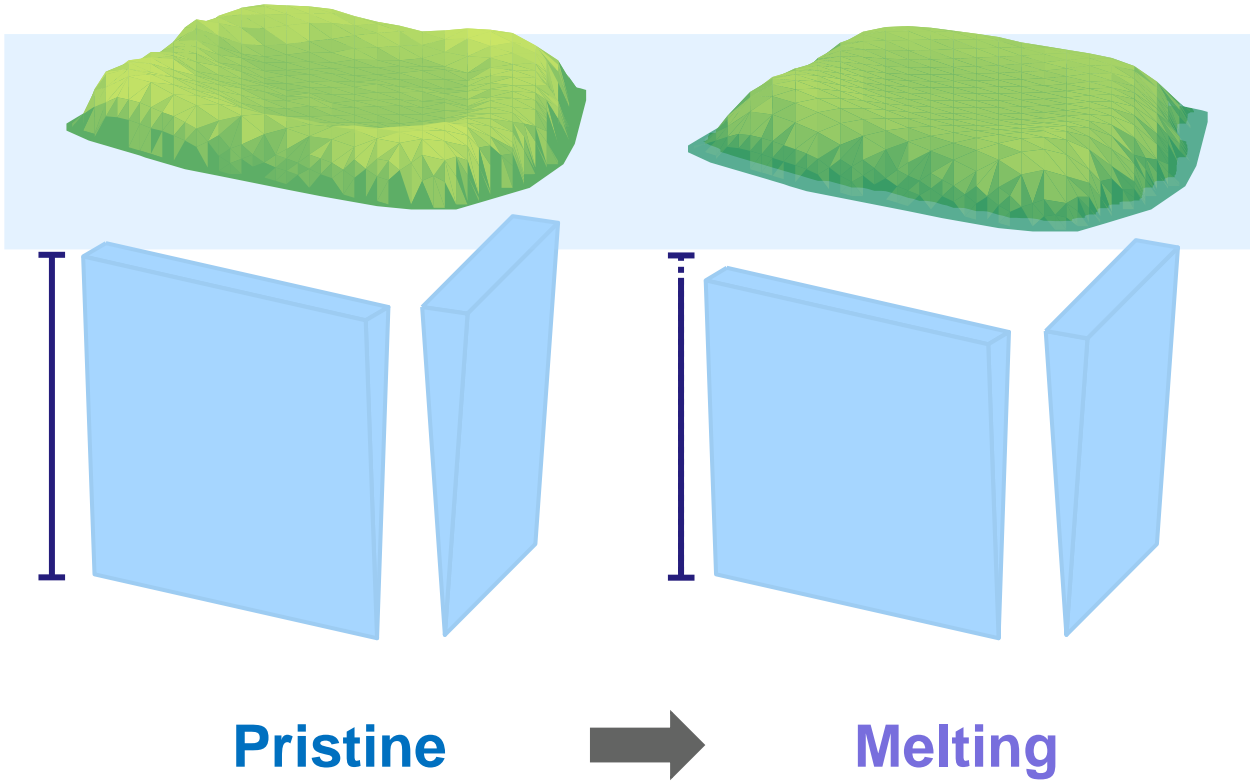


# Ice wedges and thermokarst

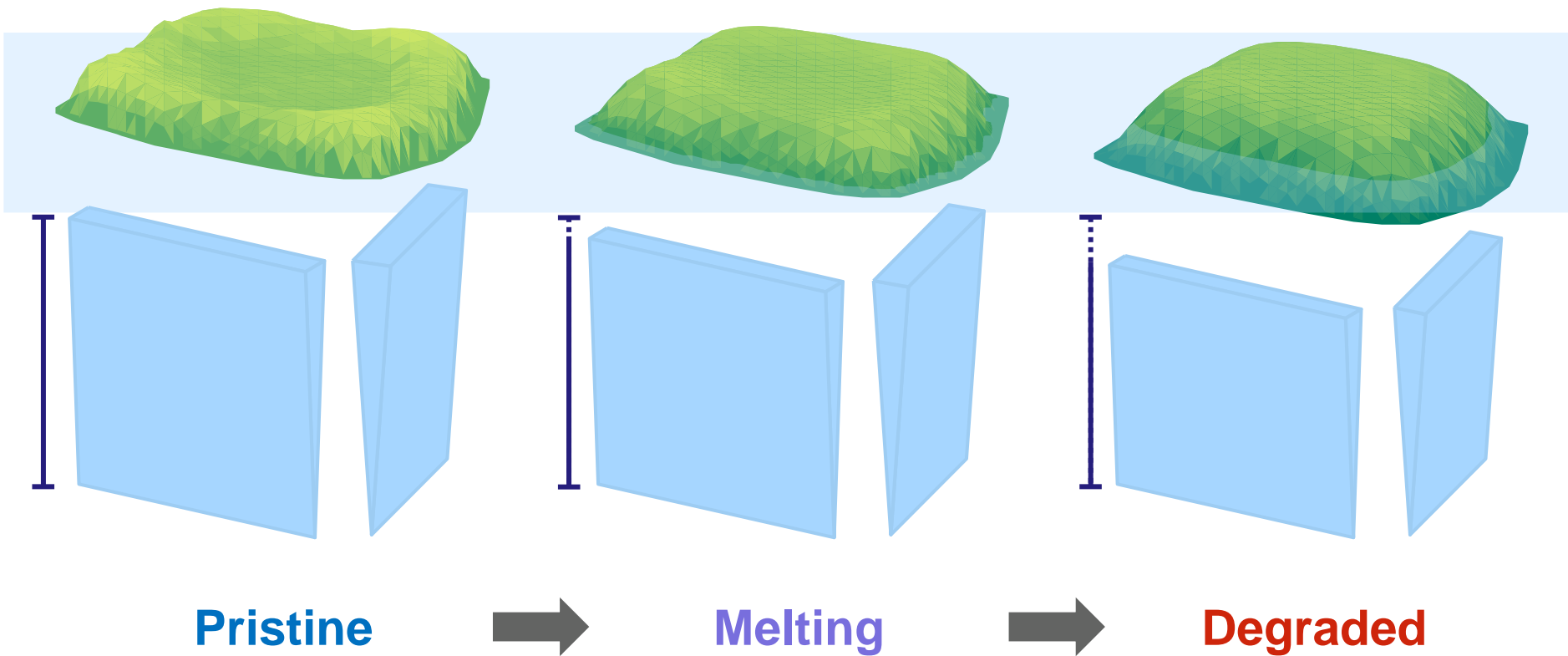


**Pristine**

# Ice wedges and thermokarst



# Ice wedges and thermokarst



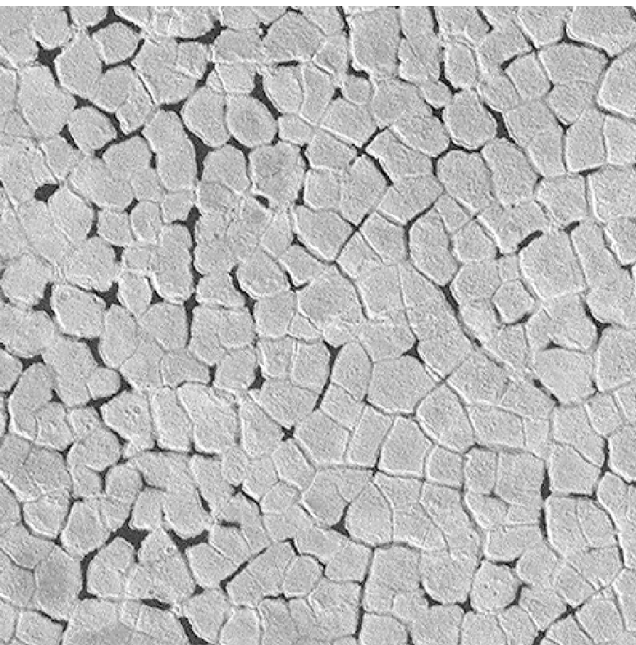
# Ice wedges and thermokarst



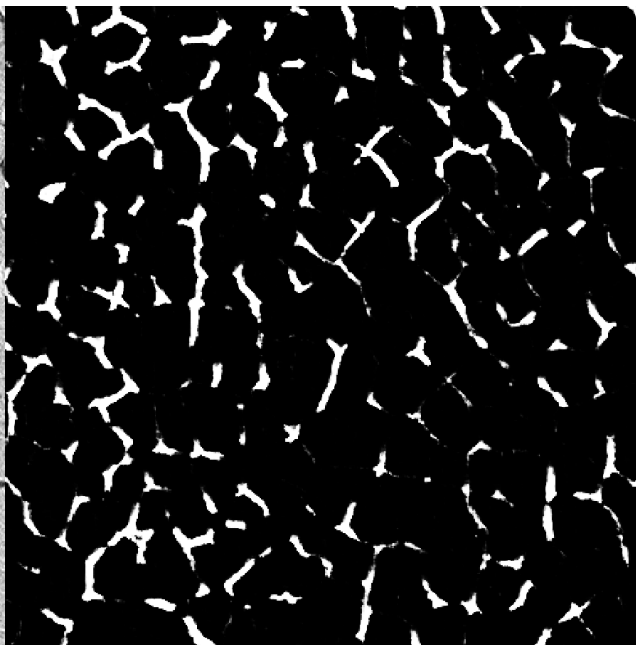


# Workflow for outlining thermokarst pools

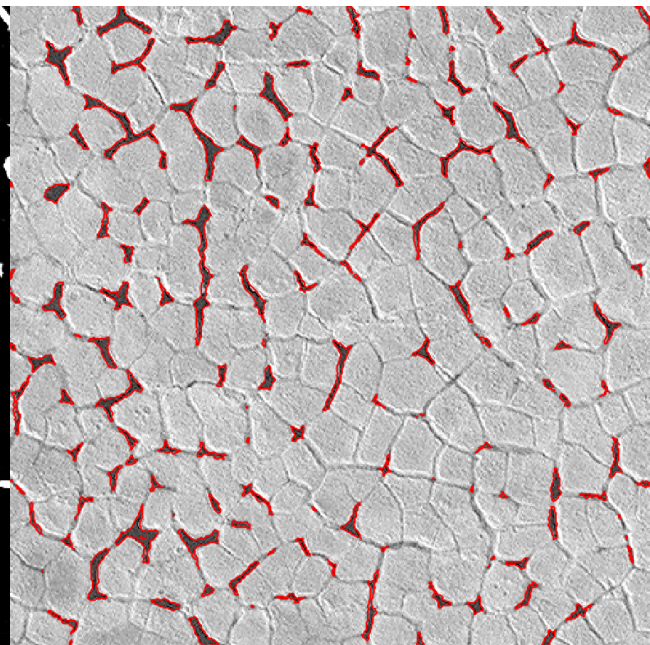
Panchromatic WorldView Data

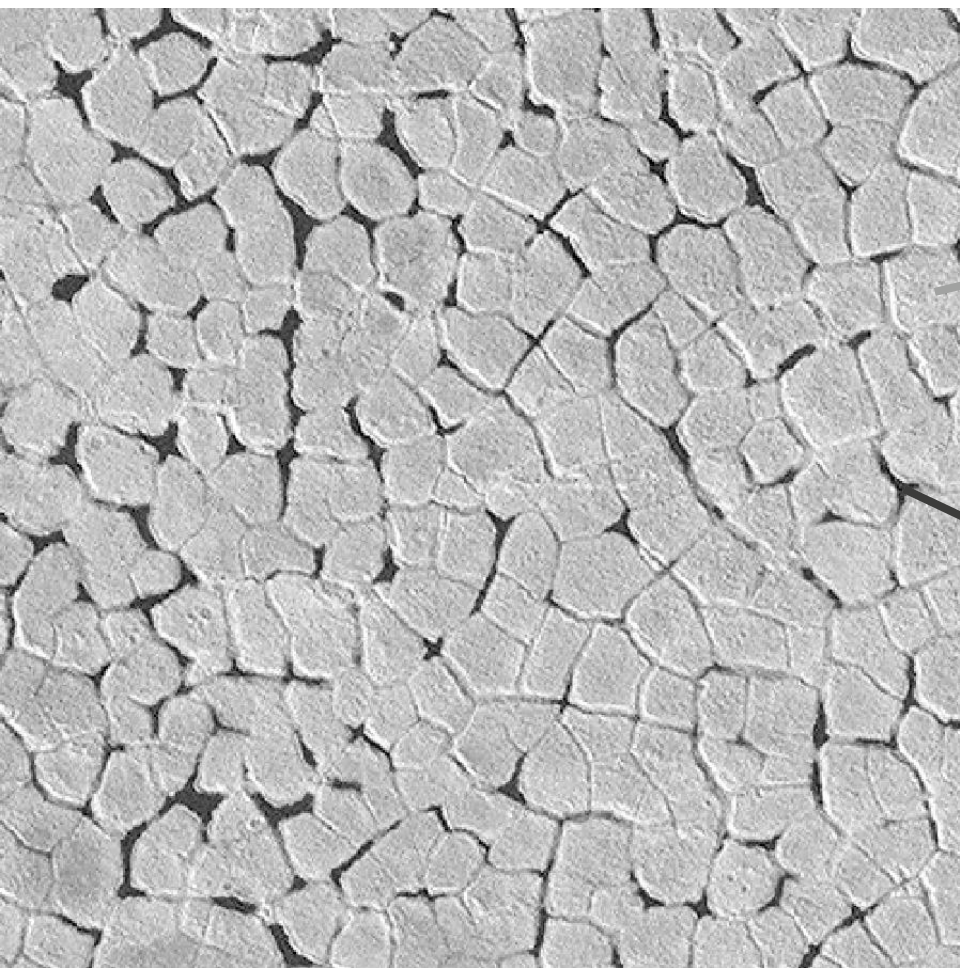


Output of CNN



Output of CRF



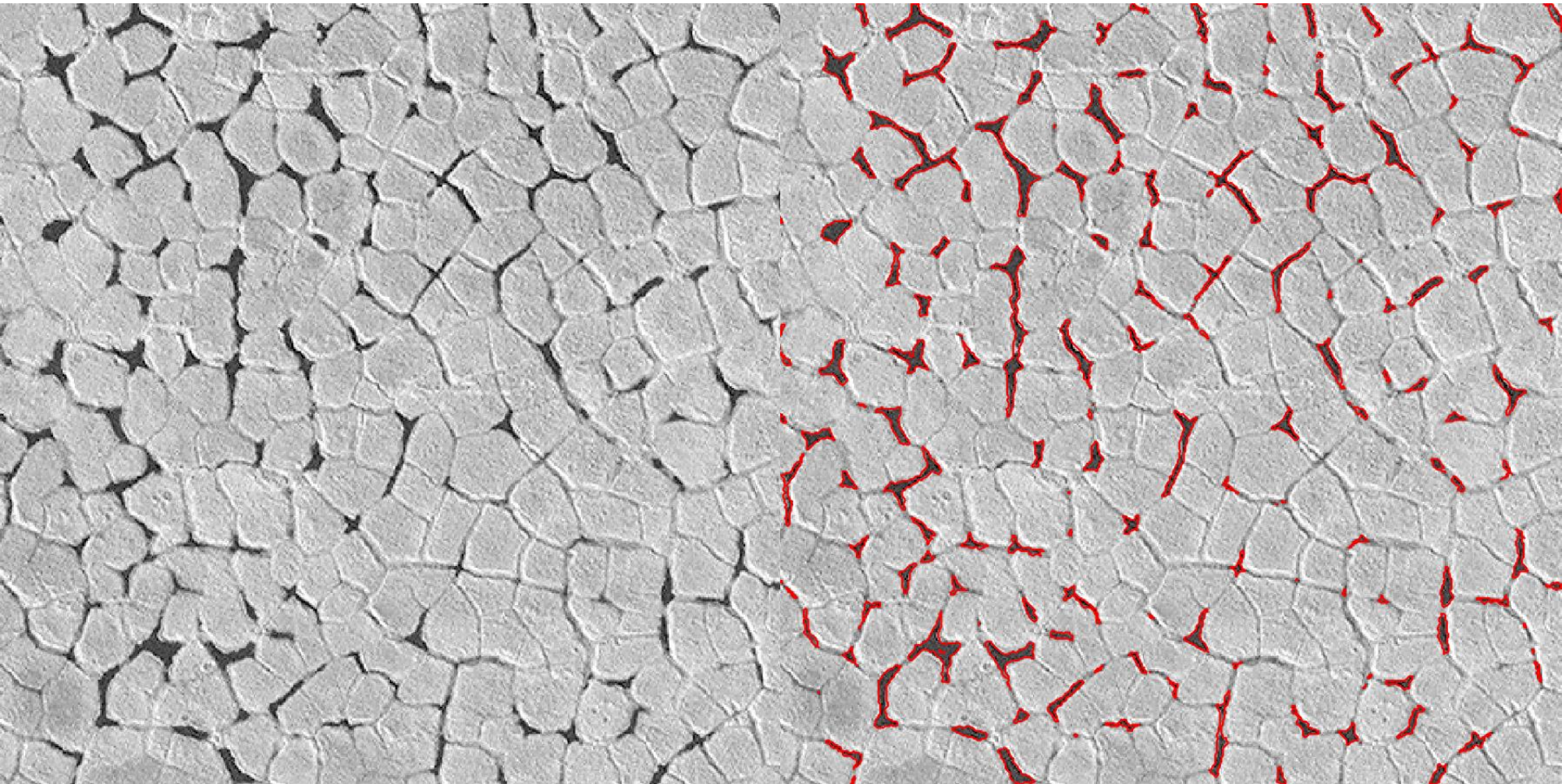


**Bare tundra**

**Thermokarst pool**

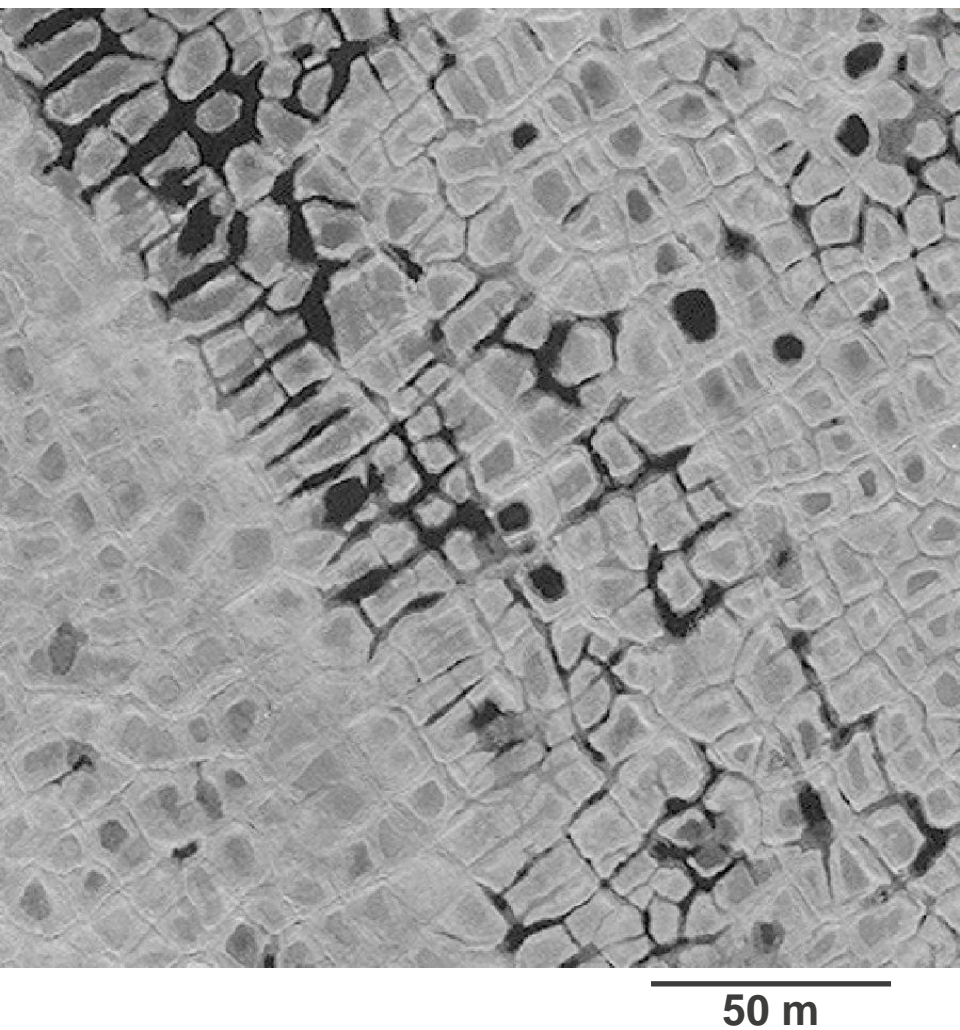
50 m



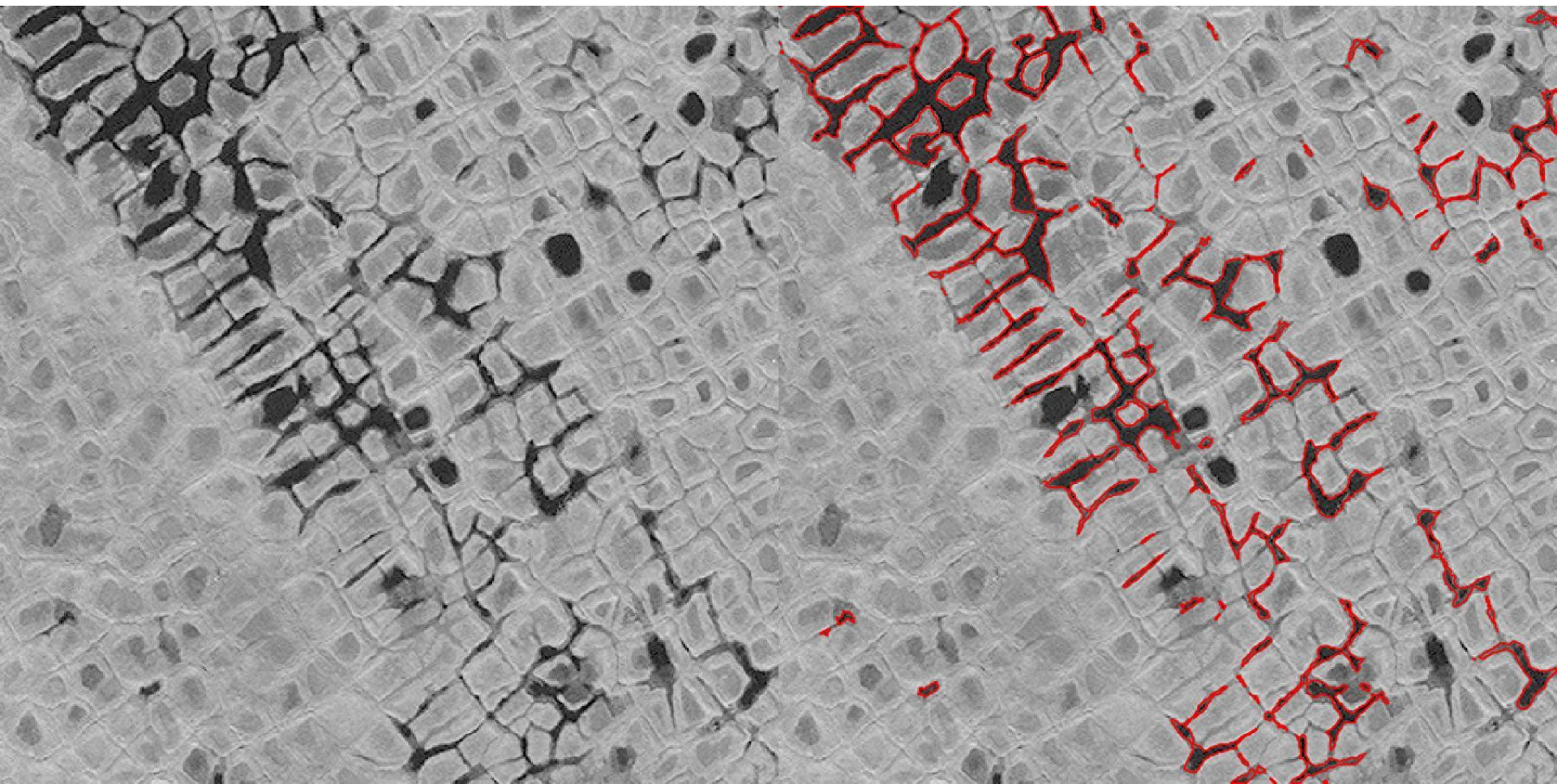


50 m





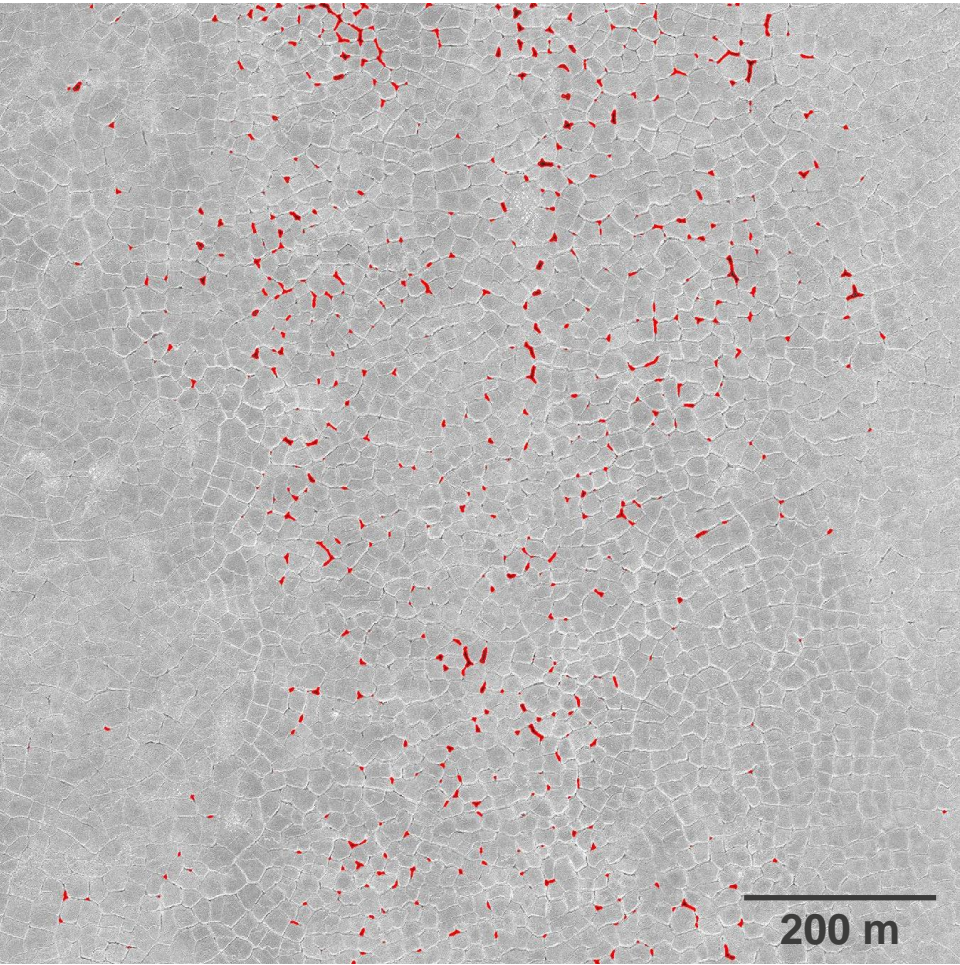
50 m



50  $\mu$ m



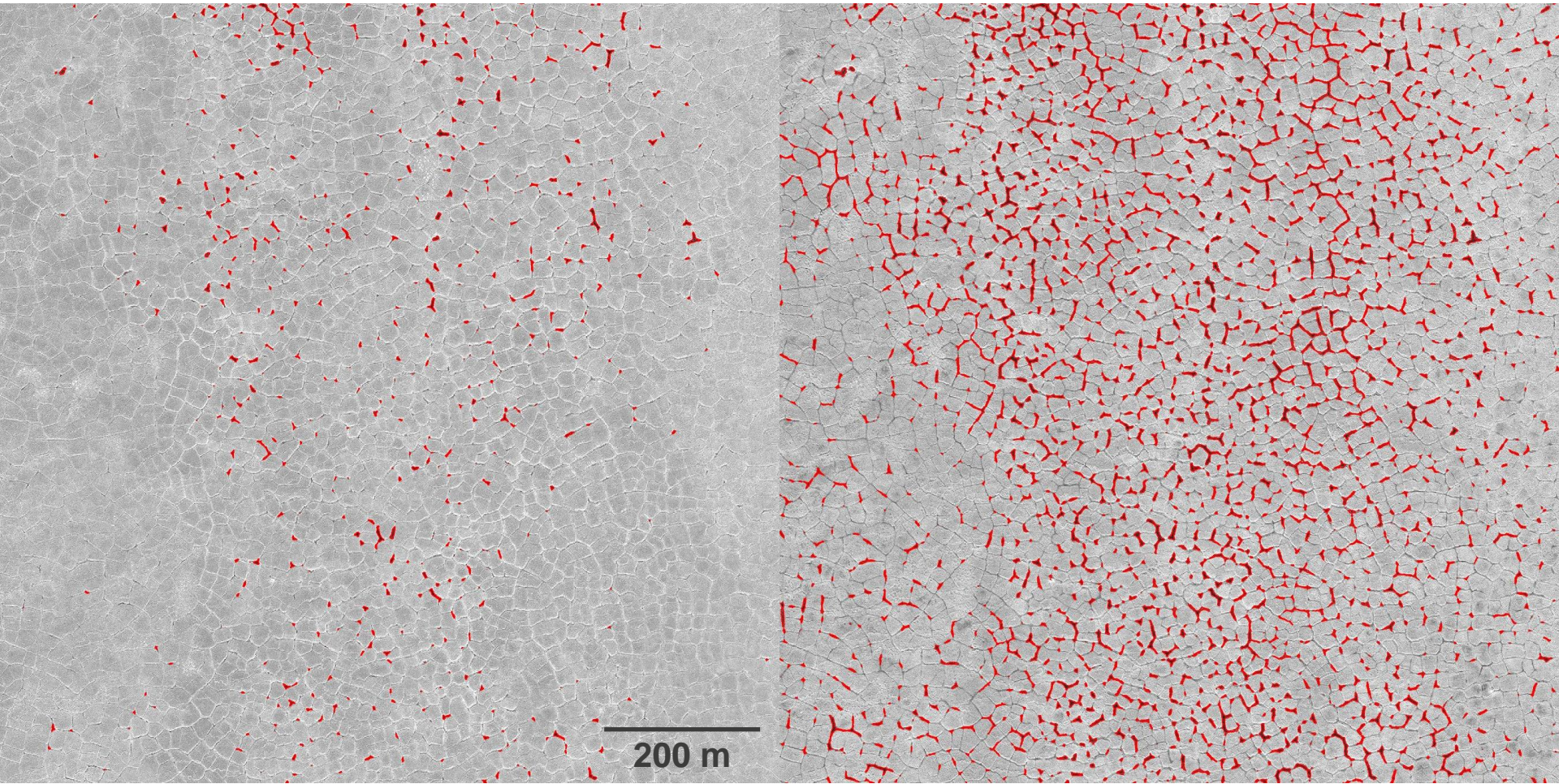
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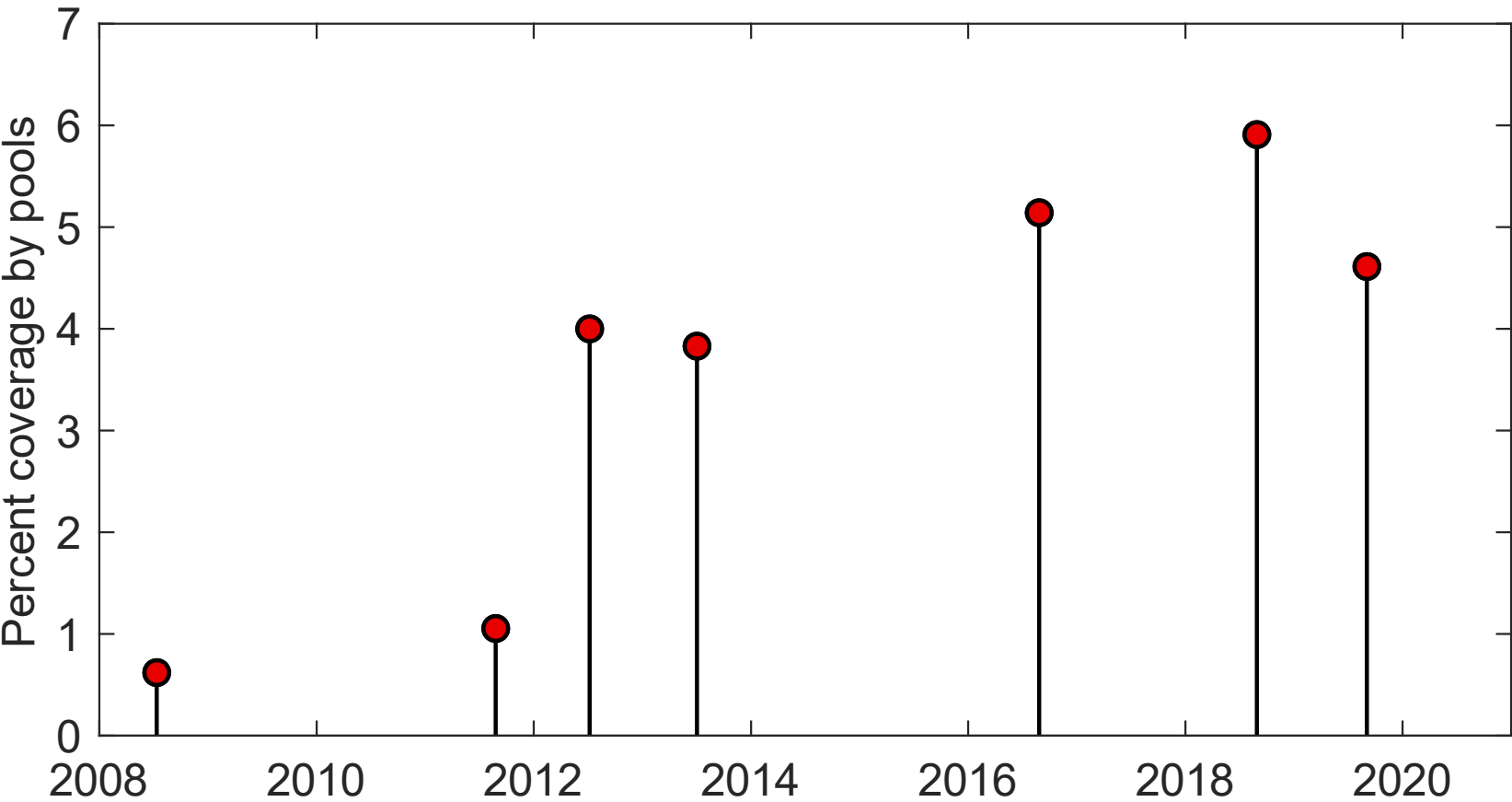


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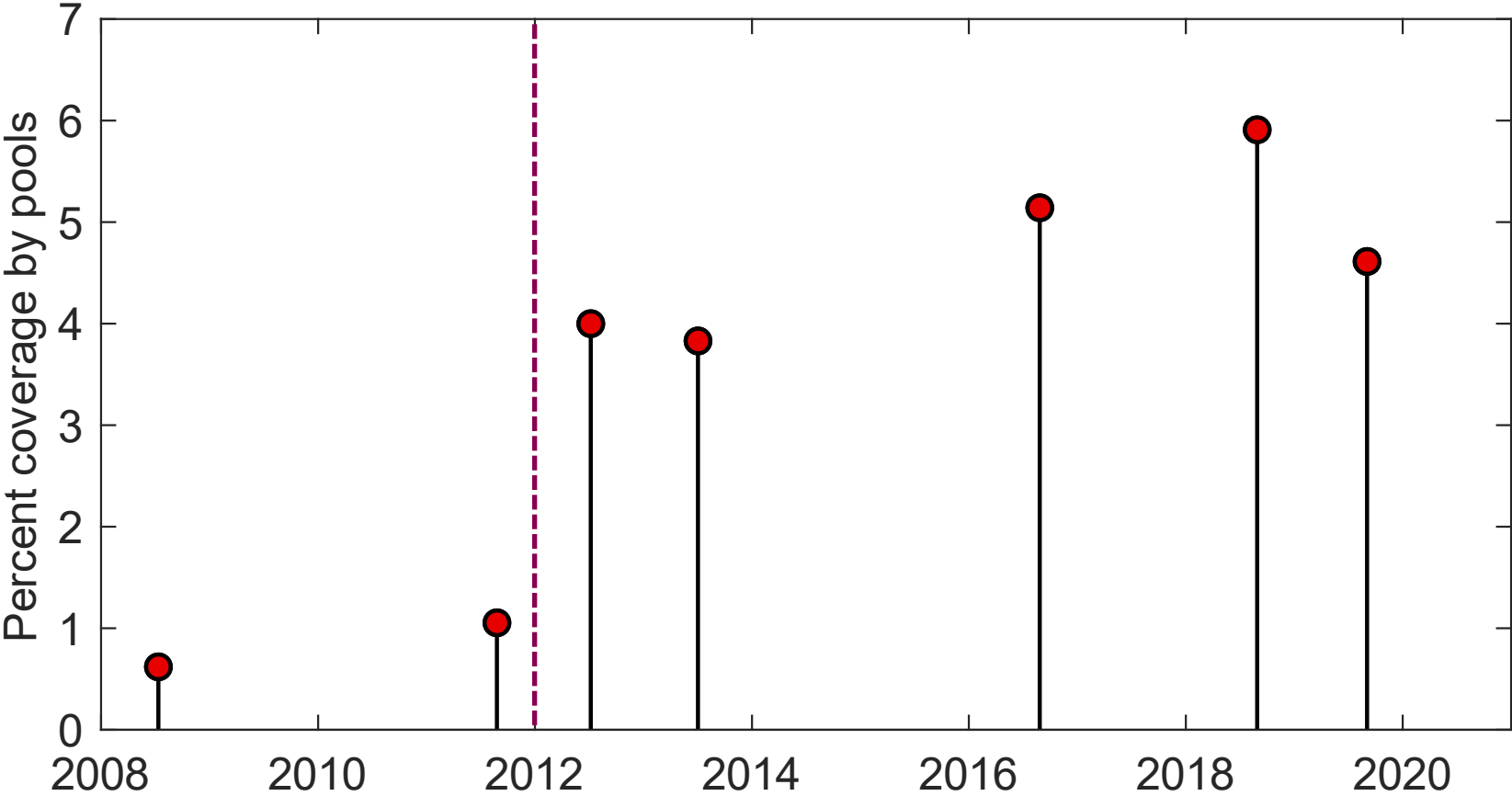
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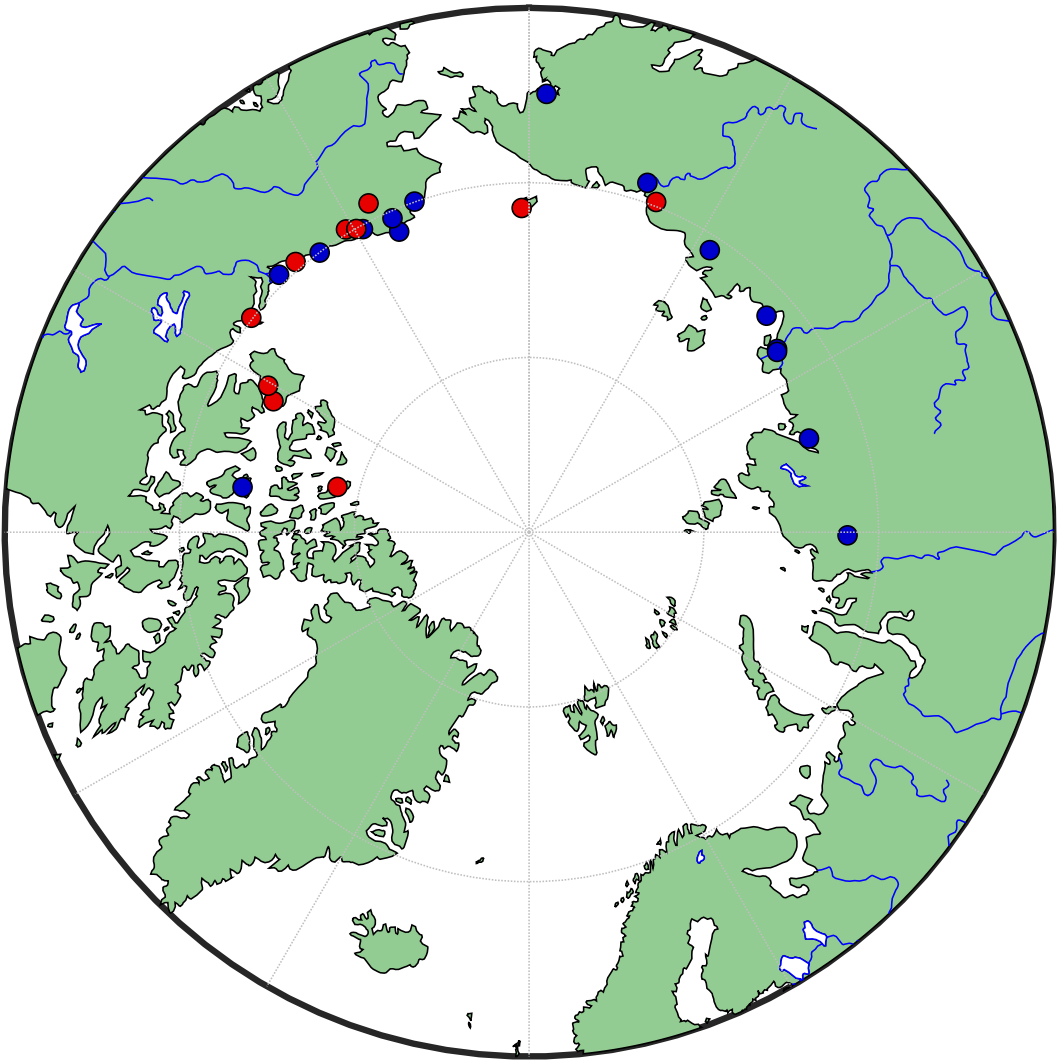
# Inundation at Prudhoe Bay, Alaska



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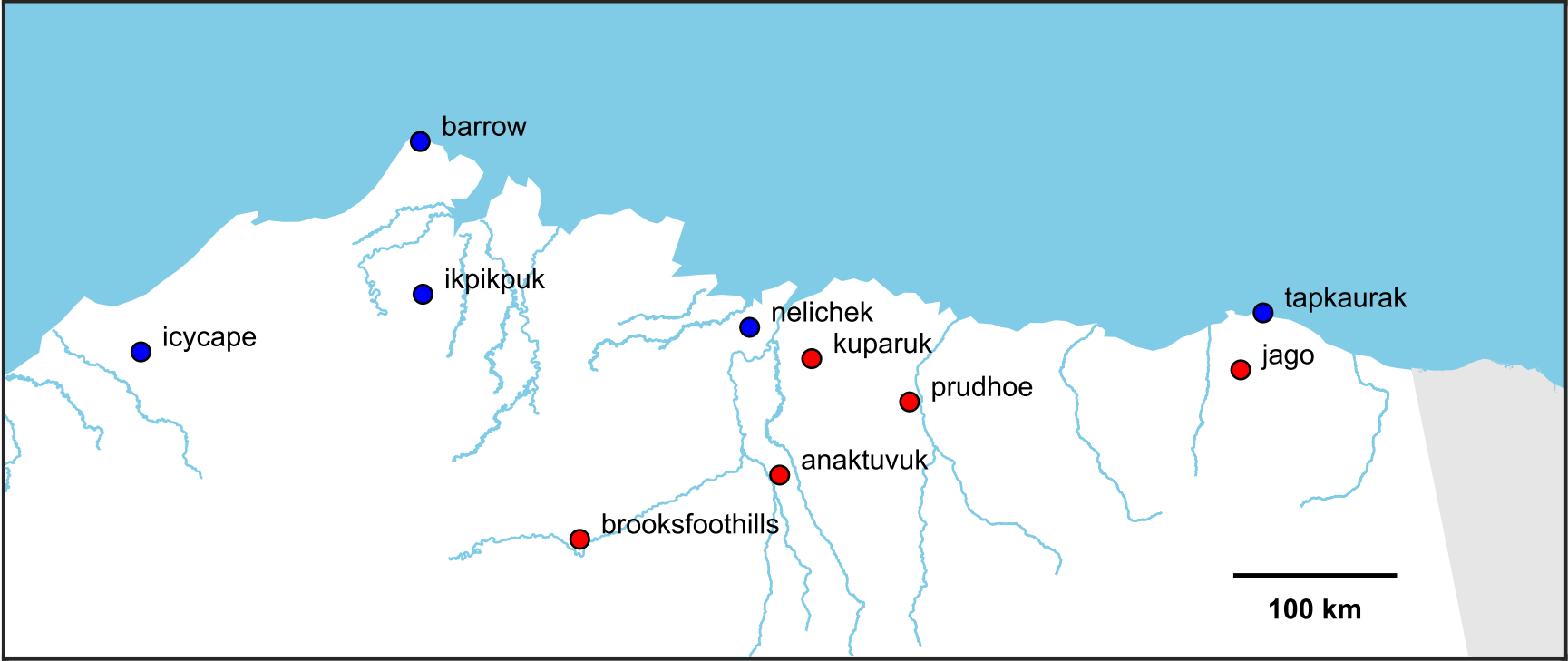








# Alaska North Slope

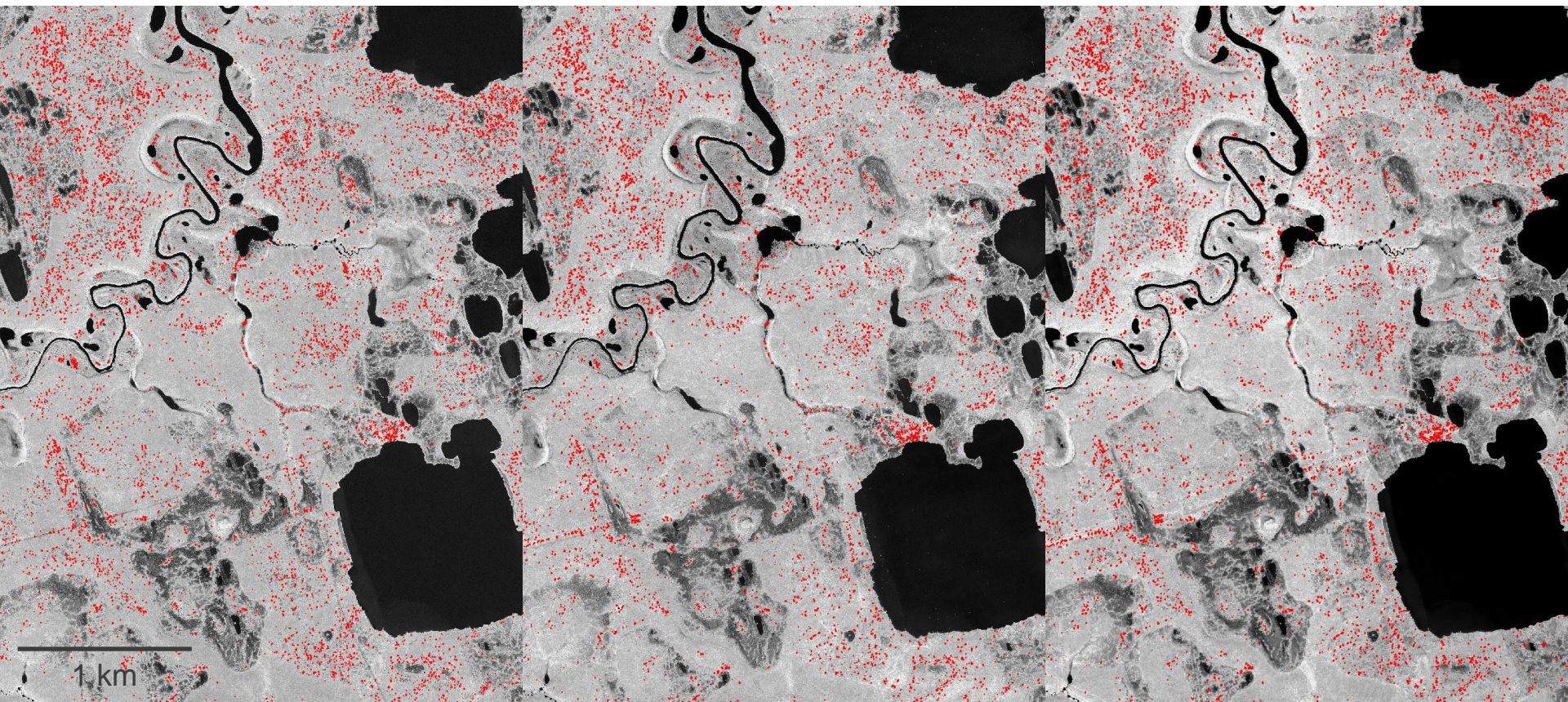


# Colville River Basin, Alaska

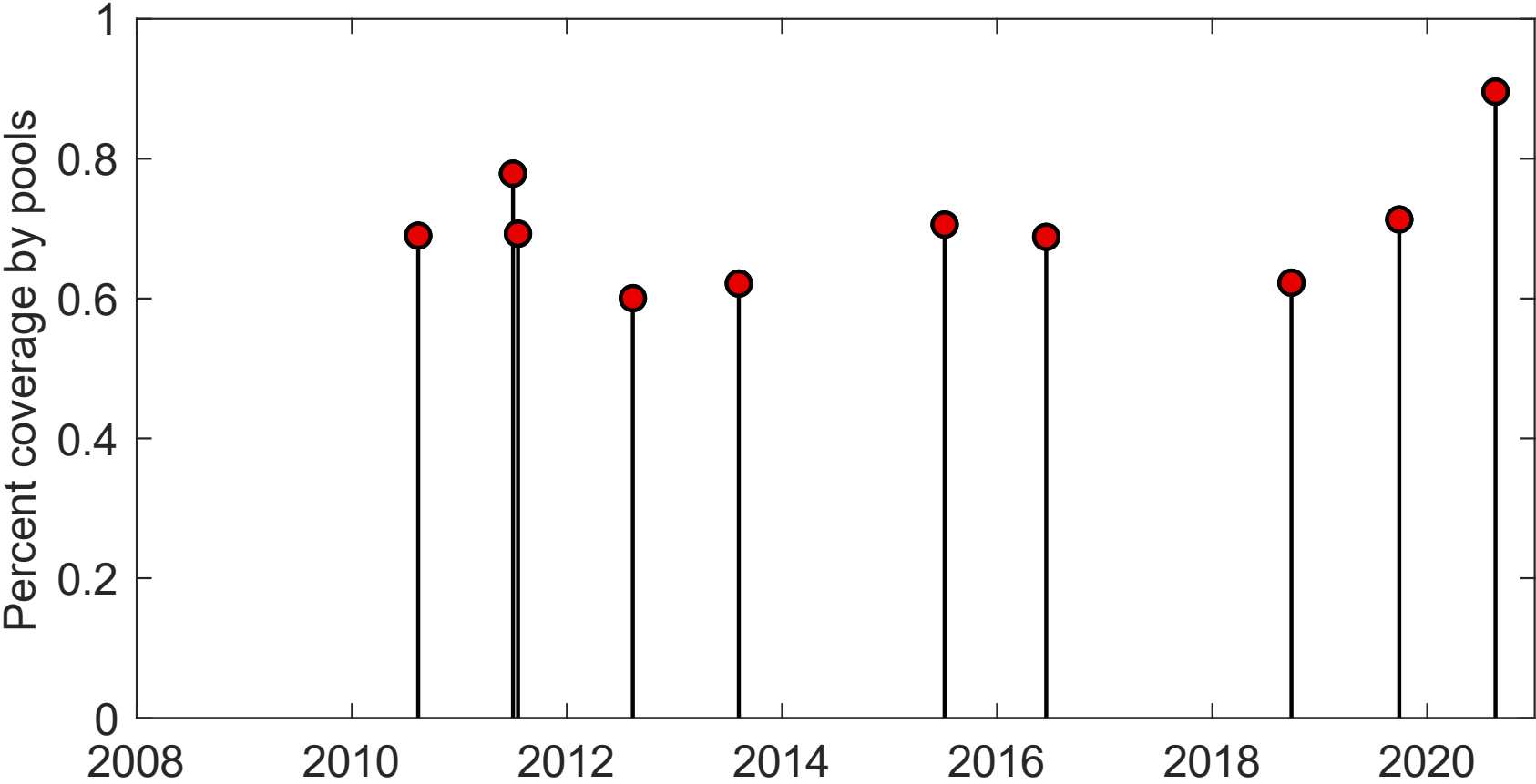
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2015-07-07

2020-08-20



# Colville River Basin, Alaska



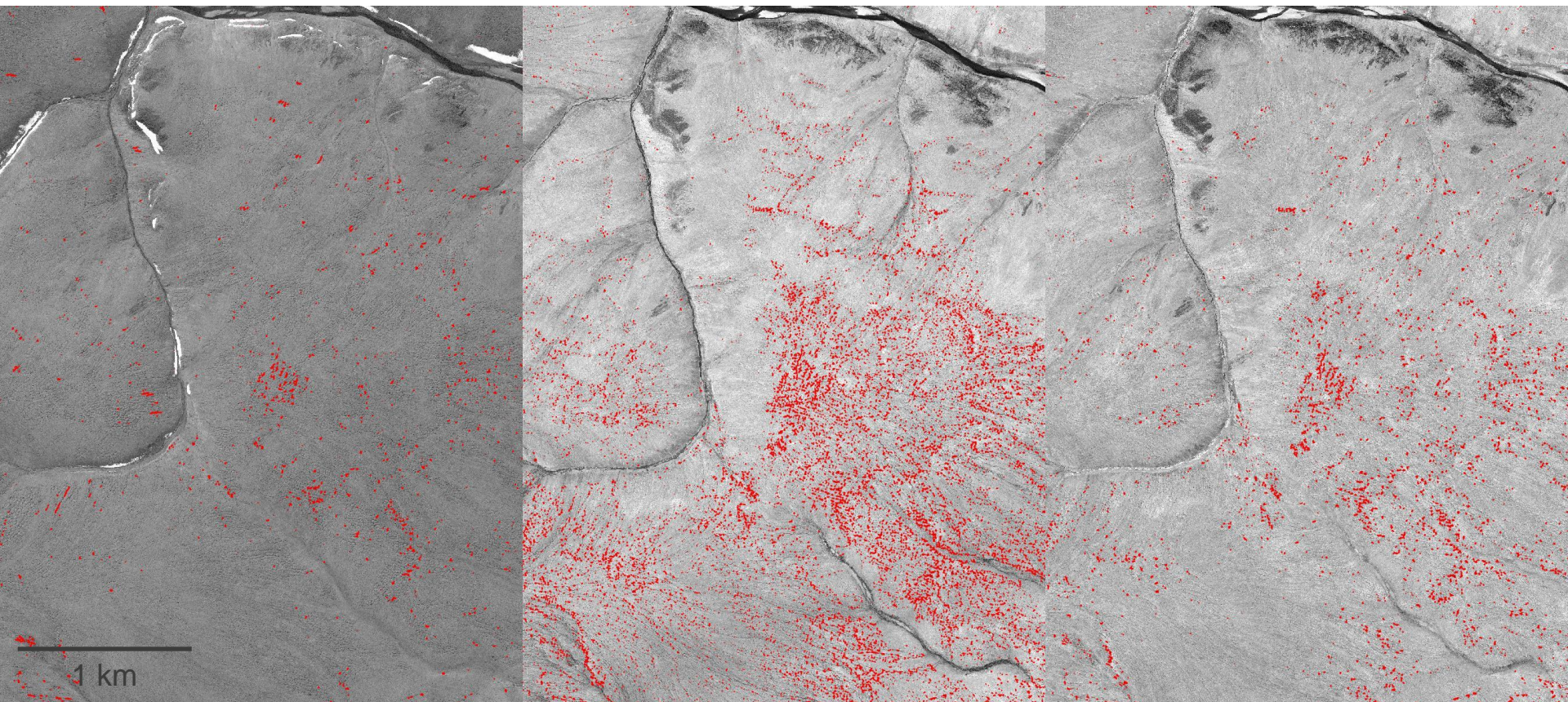


# Wrangel Island, Siberia

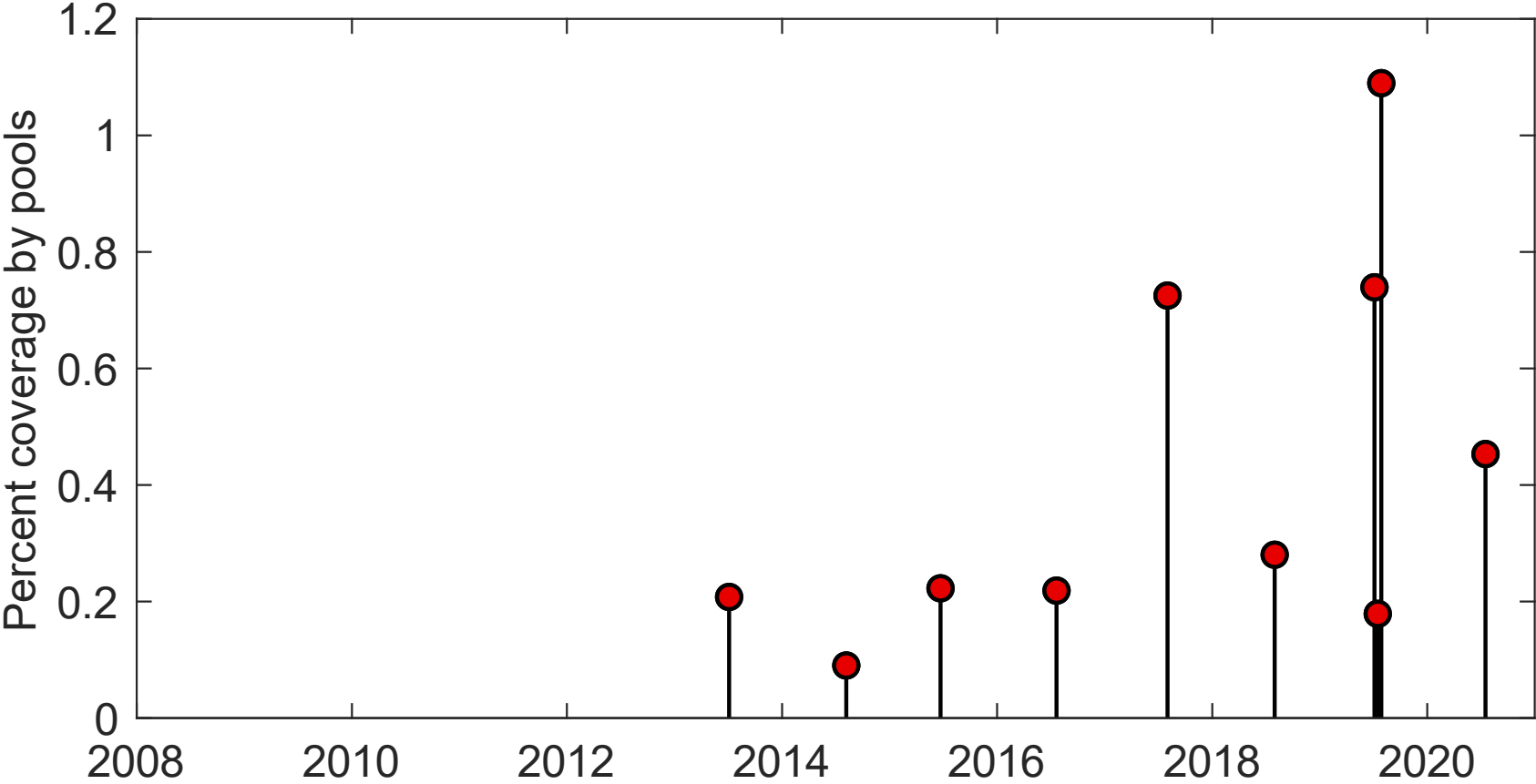
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2020-07-17

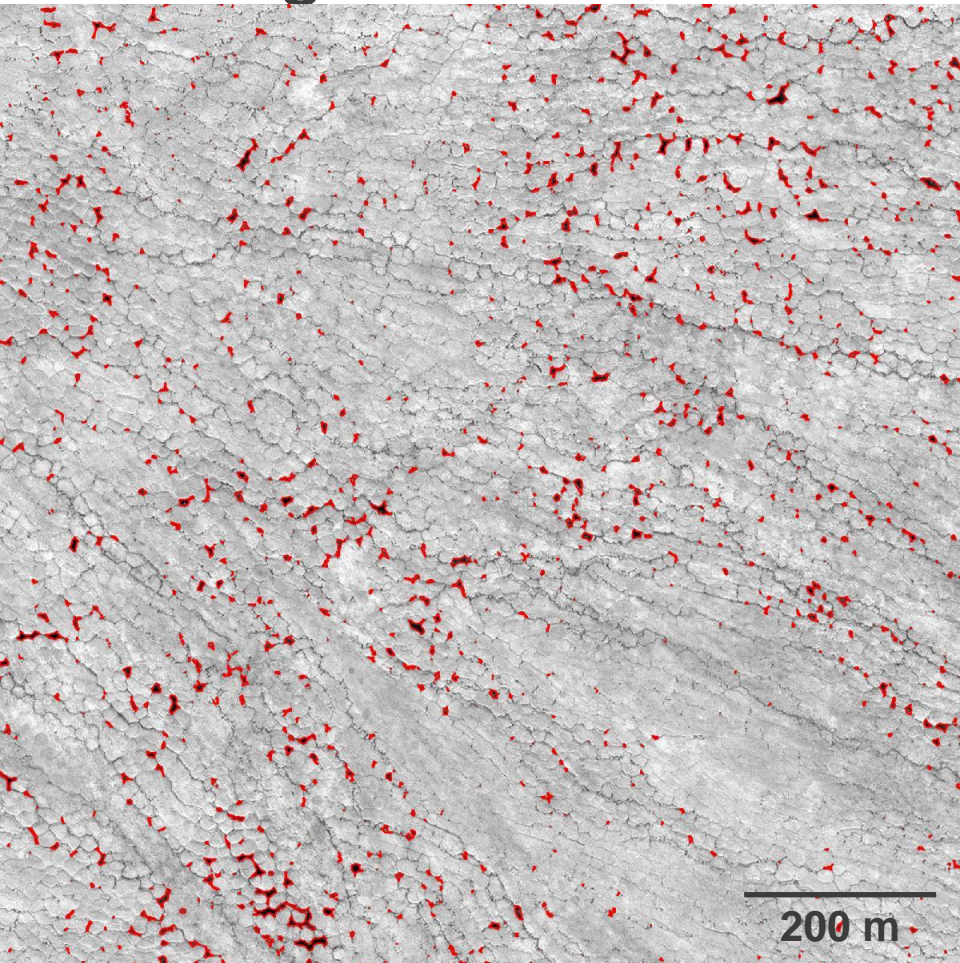


# Wrangel Island, Siberia



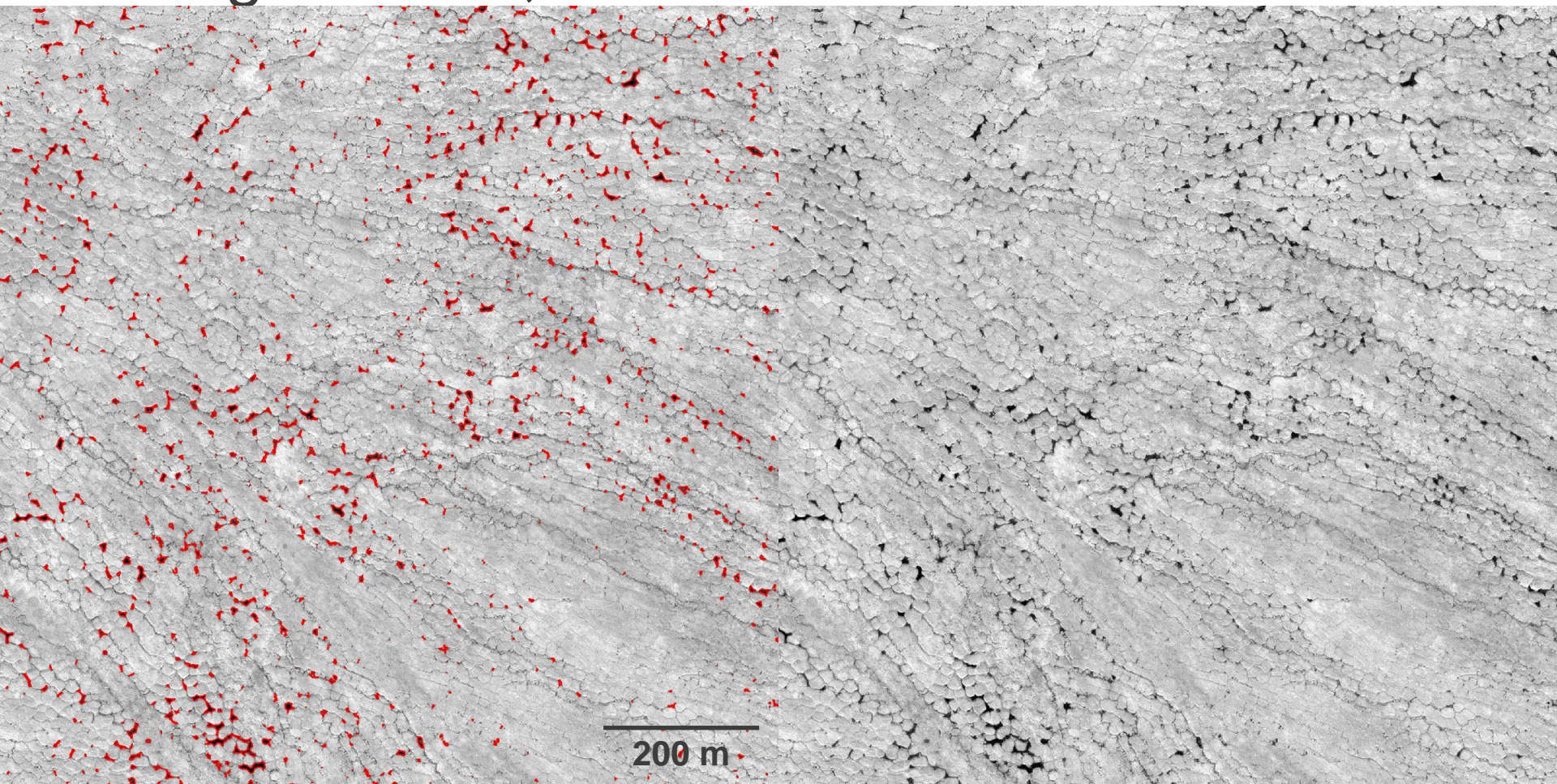


# Wrangel Island, Siberia



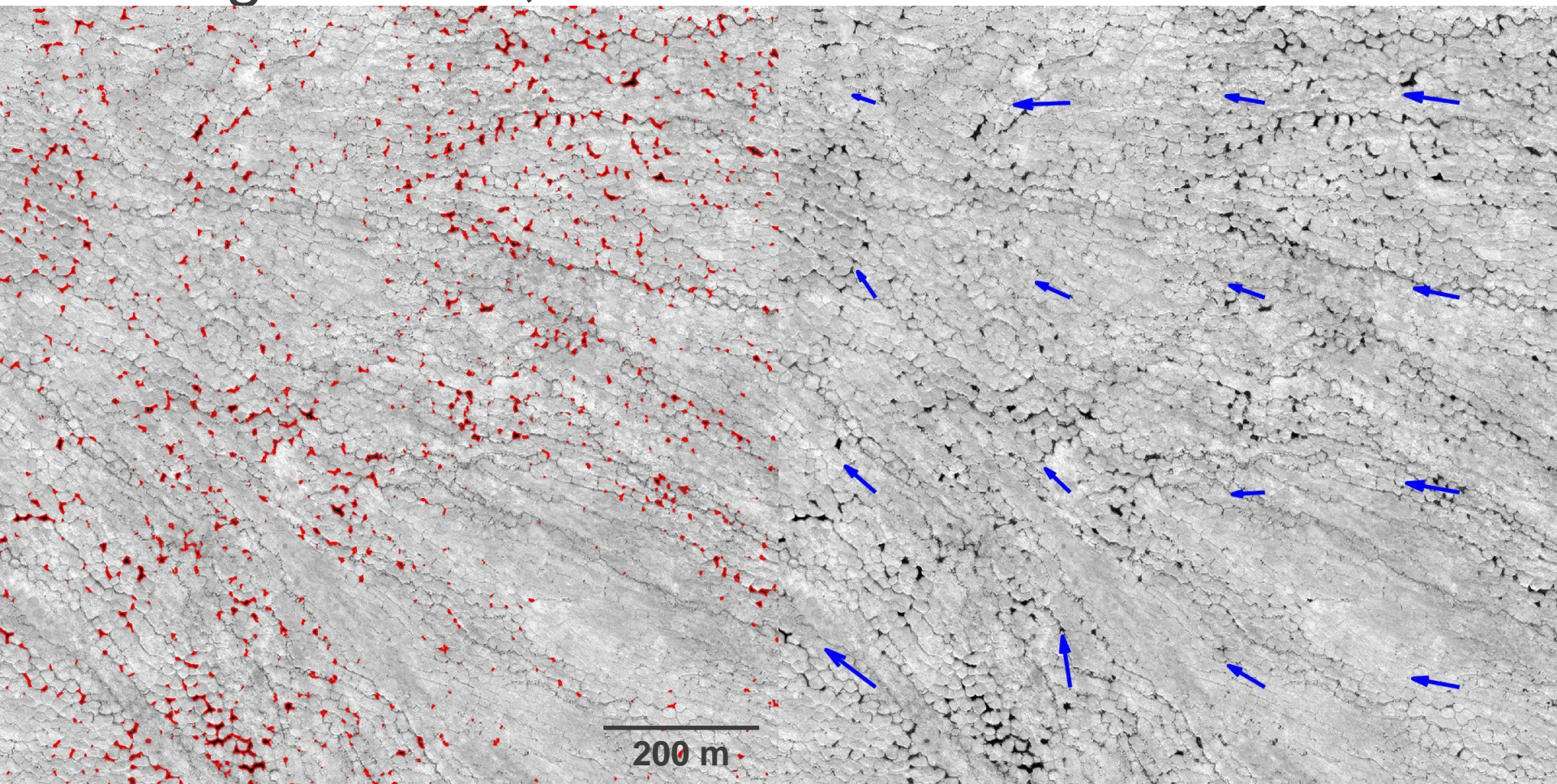


# Wrangel Island, Siberia





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# Conclusions

- Recent thermokarst pool expansion is highly heterogeneous at regional to pan-Arctic spatial scales.

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# Conclusions

- Recent thermokarst pool expansion is highly heterogeneous at regional to pan-Arctic spatial scales.
- Abrupt thermokarst pool expansion often coincides with exceptionally warm summers.
- Thermokarst pool stability at some sites may be attributable to negative ecological feedbacks.
- Lateral drainage is an important component of the water budget in some thermokarst pools in hilly terrain.

Thank you!

